

Bellringer **REVIEW**:

- What are some things that can only affect the climate over a long time?
- What are some of the effects of our changing climate?

Learning Objectives:

- I can create and demonstrate a scenario of a carbon atom going through the carbon cycle.

Check for Understanding Questions:

- How could a carbon atom go from CO₂ to an animal?
- What can you do to help rebalance the carbon cycle?
Name a few things.

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Vocabulary/Definitions

biomass:

In the energy production industry, biomass refers to living and recently living biological material which can be used as fuel for industrial production.

biosphere:

The outermost part of the Earth's shell, including land, surface rocks and the water within which life occurs.

carbon cycle:

The carbon cycle can be described as the exchange of carbon between the land, the oceans, the atmosphere and the Earth's interior.

fossil fuels:

Fossil fuels such as coal, petroleum products and natural gas are sources of ancient biomass that were formed millions of years ago from the decay of plant and animal matter.

geosphere:

The solid part of the Earth which is mostly rock and regolith (a layer of loose, heterogeneous material covering solid rock); the main divisions of the geosphere are the crust, mantle and core.

global warming:

The observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades.

photosynthesis:

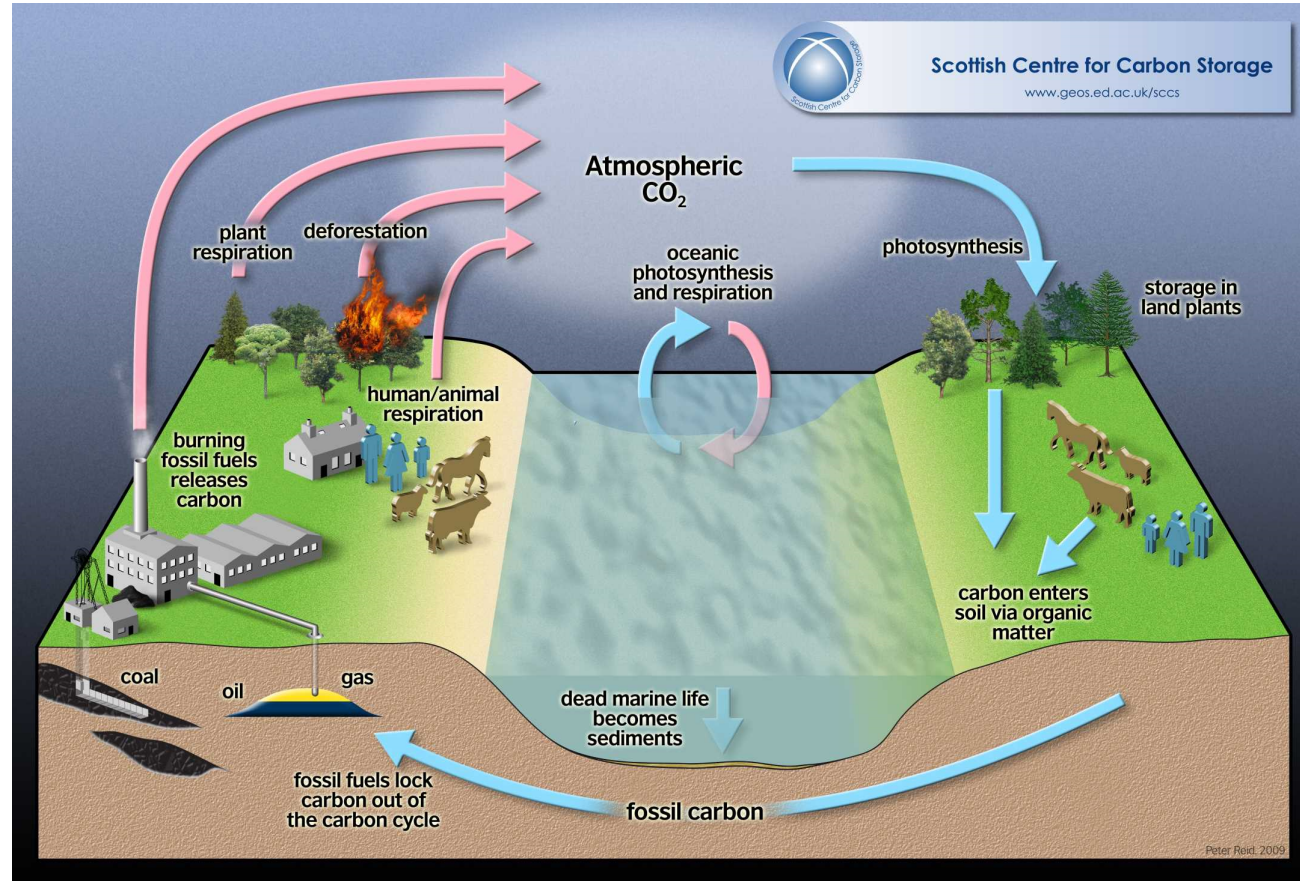
The process by which green plants create energy by absorbing solar energy and carbon dioxide from the atmosphere to produce carbohydrates (sugars). Plants "burn" these carbohydrates during respiration, which releases the energy contained in sugars to be used as fuel. Plants then release oxygen to the atmosphere, which is used for respiration by humans and other organisms.

respiration:

The process by which an organism obtains energy through the reaction of oxygen with glucose to give water, carbon dioxide and ATP (energy).

Story Time!

Read the article with your group or by yourself. Then create by drawing and labeling, or writing your own story of a carbon atom going through the Carbon Cycle.

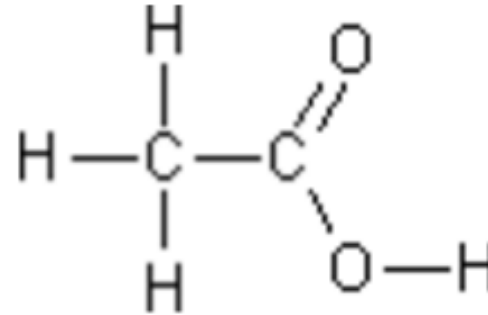
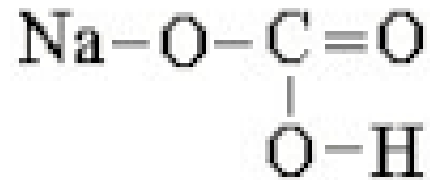




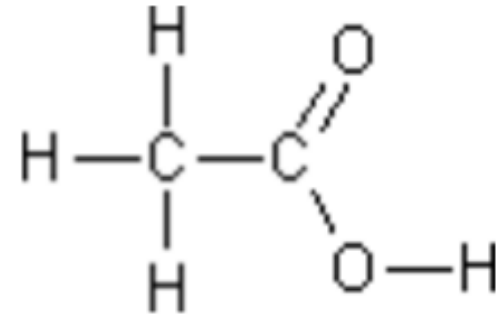
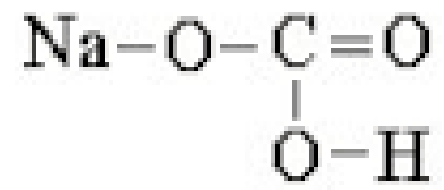
Baking Soda is made of NaHCO_3 , aka Sodium Bicarbonate

Chalk is similar and is made of CaCO_3 , aka Calcium Carbonate

Vinegar is made of CH_3COOH , aka acetic acid or ethanoic acid.



When the two react together they form H_2O , CO_2 , leftover crud.



Note: Questions 1-3 should be answered before the chemical reaction between the vinegar and crushed chalk is carried out.

1. Record the mass of the Baking Soda (container #1). _____
2. Record the mass of the Vinegar (container #2). _____
3. Record the mass of the reactant products (exhaled dinosaur breath (CO₂) + water + calcium compound) after the experiment has been carried out.
4. By adding vinegar to the baking soda, how much carbon was released? Hint: Add the mass of the crushed chalk and the vinegar before the experiment was carried out. Subtract from this value the mass of the reactant products. _____
5. Write the chemical reaction that occurred between the crushed chalk and the vinegar _____ + _____ => _____ + _____ + _____

Carbon is increasing in atmosphere, oceans, and land biota. Plate tectonics and the rock reservoir is not.

Source of CO₂ is from fossil fuels and burning.

Explain why people are concerned with the rising level of carbon dioxide in the atmosphere (CO₂).
What are engineers doing to rebalance the carbon cycle?

Check for Understanding Questions:

- How could a carbon atom go from CO₂ to an animal?
- What can you do to help rebalance the carbon cycle?
Name a few things.

Learning Objectives: Did you accomplish them?

- I can create and demonstrate a scenario of a carbon atom going through the carbon cycle.

Self-Evaluation

- How well did you understand the material today?
(1-Lost, 2- understand, 3-can teach it)
- How well did you and your team members participate in class?
(1-didn't do anything, 2-Bare minimum, 3-fully participated)